

PROXIMITY DETECTION SYSTEMS FOR CONTINUOUS MINING MACHINES IN UNDERGROUND COAL MINES

RULE & COMPLIANCE

The rule became effective on March 16, 2015

This power point presentation is a briefing tool only.

The final rule can be accessed from following link.

<http://www.msha.gov/regs/fedreg/final/2015/proximity-detection/>

Accident Data

- To assess the costs and benefits of the final rule, MSHA conducted a review of fatal and nonfatal pinning, crushing, and striking accidents, which occurred in underground coal mines from 1984 through 2013.
- Of the 75 preventable fatalities resulting from pinning, crushing, and striking accidents, 34 of those were associated with continuous mining machines (CMMs).
- During this same time period, MSHA estimated that the use of a proximity detection system could have prevented 238 nonfatal injuries associated with CMMs.
- Since 2010, 8 miners working in close proximity to CMMs died from pinning, crushing, or striking accidents.
- MSHA projects that the rule will prevent approximately 49 injuries and 9 deaths over the next 10 years.

Proximity Detection Systems

- The following four systems are MSHA approved:
 - Nautilus Coal Buddy
 - Strata Mining Products HazardAvert® System
 - Matrix Design Group M3-1000 /Joy Global SmartZone® Proximity System Generation 1
 - Matrix Design Group IntelliZone™ /Joy Global SmartZone® Proximity System Generation 2
- MSHA approvals ensure that the proximity detection system will not introduce an ignition hazard when operated in potentially explosive atmospheres.

Proximity Detection System Requirements

§75.1732

- Operators must install a proximity detection system on certain CMMs.
 - (a) *Machines covered.* Operators must equip continuous mining machines, except full-face continuous mining machines, with proximity detection systems by the following dates. For proximity detection systems with miner-wearable components, the mine operator must provide a miner-wearable component to be worn by each miner on the working section by the following dates.

Machines Covered

§75.1732 (a)

- (1) Continuous mining machines manufactured after March 16, 2015 must meet the requirements in §75.1732 no later than November 16, 2015. These machines must meet these requirements when placed in service with a proximity detection system.
- (2) Continuous mining machines manufactured and equipped with a proximity detection system on or before March 16, 2015 must meet the requirements in §75.1732 no later than September 16, 2016.
- (3) Continuous mining machines manufactured and not equipped with a proximity detection system on or before March 16, 2015 must meet the requirements in §75.1732 no later than March 16, 2018. These machines must meet these requirements when placed in service with a proximity detection system.

MSHA interprets the March 16, 2018 date to also apply to continuous mining machines with an existing proximity detection system that requires the installation of a new proximity detection system to meet the requirements of the rule. For these machines, MSHA anticipates that the new proximity detection system will be installed during the first planned rebuild.

See Program Policy Letter, P15-V-01.

Proximity Detection System Requirements

§75.1732 (b)

(b) *Requirements for a proximity detection system.* A proximity detection system includes machine-mounted components and miner-wearable components. The system must:

- (1) Cause a machine, which is tramming from place-to-place or repositioning, to stop before contacting a miner except for a miner who is in the on-board operator's compartment;
- (2) Provide an audible and visual warning signal on the miner-wearable component and a visual warning signal on the machine that alert miners before the system causes a machine to stop. These warning signals must be distinguishable from other signals;
- (3) Provide a visual signal on the machine that indicates the machine-mounted components are functioning properly;

MSHA Approved Proximity Detection Systems

- Two MSHA-approved systems provide an audible and visual warning signal on the miner-wearable component and a visual warning signal on the machine that alert miners before the system causes a machine to stop, as required by the final rule.
 - Strata Mining Products HazardAvert® System
 - Matrix Design Group IntelliZone™ /Joy Global SmartZone® Proximity System Generation 2
- As of January 2015, approximately 425 out of 863 CMMs were equipped with a proximity detection system..

Proximity Detection System Requirements

§75.1732 (b)

- (4) Prevent movement of the machine if any machine-mounted component of the system is not functioning properly. However, a system with any machine-mounted component that is not functioning properly may allow machine movement if it provides an audible or visual warning signal, distinguishable from other signals, during movement. Such movement is permitted only for purposes of relocating the machine from an unsafe location for repair;
- (5) Be installed to prevent interference that adversely affects performance of any electrical system; and
- (6) Be installed and maintained in proper operating condition by a person trained in the installation and maintenance of the system.

System Checks

§75.1732 (c)

(c) *Proximity detection system checks.* Operators must:

- (1) Designate a person who must perform a check of machine-mounted components of the proximity detection system to verify that components are intact, that the system is functioning properly, and take action to correct defects —
 - (i) At the beginning of each shift when the machine is to be used; or
 - (ii) Immediately prior to the time the machine is to be operated if not in use at the beginning of a shift; or
 - (iii) Within 1 hour of a shift change if the shift change occurs without an interruption in production.
- (2) Check for proper operation of miner-wearable components at the beginning of each shift that the components are to be used and correct defects before the components are used.

Certifications and Records

§75.1732 (d)

(d) *Certifications and records.* The operator must make and retain certifications and records as follows:

- (1) At the completion of the check of machine-mounted components required under paragraph (c)(1) of §75.1732, a certified person under § 75.100 must certify by initials, date, and time that the check was conducted. Defects found as a result of the check, including corrective actions and dates of corrective actions, must be recorded before the end of the shift;
- (2) Make a record of the defects found as a result of the check of miner-wearable components required under paragraph (c)(2) of §75.1732, including corrective actions and dates of corrective actions;
- (3) Make a record of the persons trained in the installation and maintenance of proximity detection systems required under paragraph (b)(6) of §75.1732;
- (4) Maintain records in a secure book or electronically in a secure computer system not susceptible to alteration; and
- (5) Retain records for at least one year and make them available for inspection by authorized representatives of the Secretary and representatives of miners.

Training Requirements

- Task Training on a proximity detection system, other than for installing and maintaining systems, is required by Part 48.7 (a) task training.
- All miners working near CMMs that are newly equipped with a proximity detection system must receive task training. For example, training could include:
 - operation during tramming, cutting, and loading
 - Warning stop zone size and shape
 - Response to warning signals
 - Response to system malfunction
 - Re-charging and wearing the miner wearable components
- Task Training should include a combination of classroom and hands-on training during non-production activities.

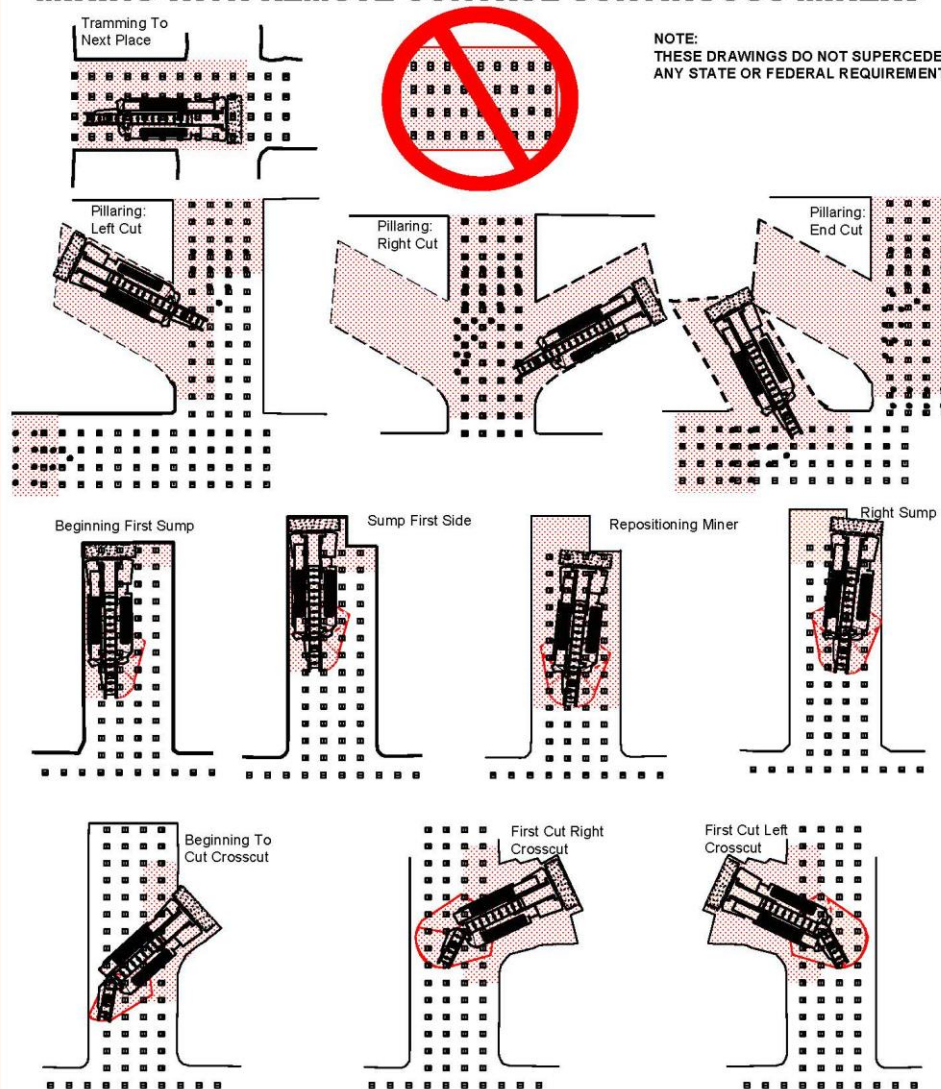
Training Requirements

- Machine operators are required to get hands-on training to help them determine appropriate work locations and safe operating practices (in a controlled supervised non-production activity).

RED ZONES ARE NO ZONES

FOR

MINING WITH REMOTE CONTROL CONTINUOUS MINERS



Developed through a cooperative effort between MSHA's District 5 Office, the Virginia DMHE, and local mining companies

United States Department of Labor

MSHA
Mine Safety and Health Administration